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**SITES FROM THE STONE AGE IN DUNAJEC RIVER  
UPPER CATCHMENT BASIN — NEW PERSPECTIVE**

ABSTRACT

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Recently, the region of Podhale has yielded several new archaeological finds, gathered during the surface survey (difficult to carry on in that region due to the decreasing number of cultivated fields) in the area of Biały Dunajec and Czarny Dunajec rivers catchment basins. Artifacts can be linked with the period of Stone Age and Early Bronze Age. In some cases, their techno-typological profiles suggest a more precise chronology. The choice of raw material used in the described inventories is limited to flint and radiolarite (its red variation).

**Key words:** Polish West Carpathians; Podhale Region; radiolarite; surface survey

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INTRODUCTION

The area that is a subject of this paper is located in the Polish part of Central Western Carpathians, in the macroregion of Orawsko-Podhalańska Depression (Podhale; Kondracki 1977; 1994; 2000; Balon *et al.* 1995).

The sites in question are all situated in the area of a catchment basins of Czarny and Biały Dunajec rivers (Fig. 1:A). Presented discoveries are a result of survey undertaken last years in the described area. Supported by the data gathered in 1980' by P. Valde-Nowak, the research team from Institute of Archaeology, Jagiellonian University, conducted a verification of several “archival” (never published) sites: Szaflary, sites 1 and 2, Bańska, site 1, Biały Dunajec, sites 1, 2, 3 and a stray find from Rogoźnik (negatively verified). Also, in their close vicinity, two new locations were found: Krauszów 2 and Rogoźnik 1 (Fig. 1:B).

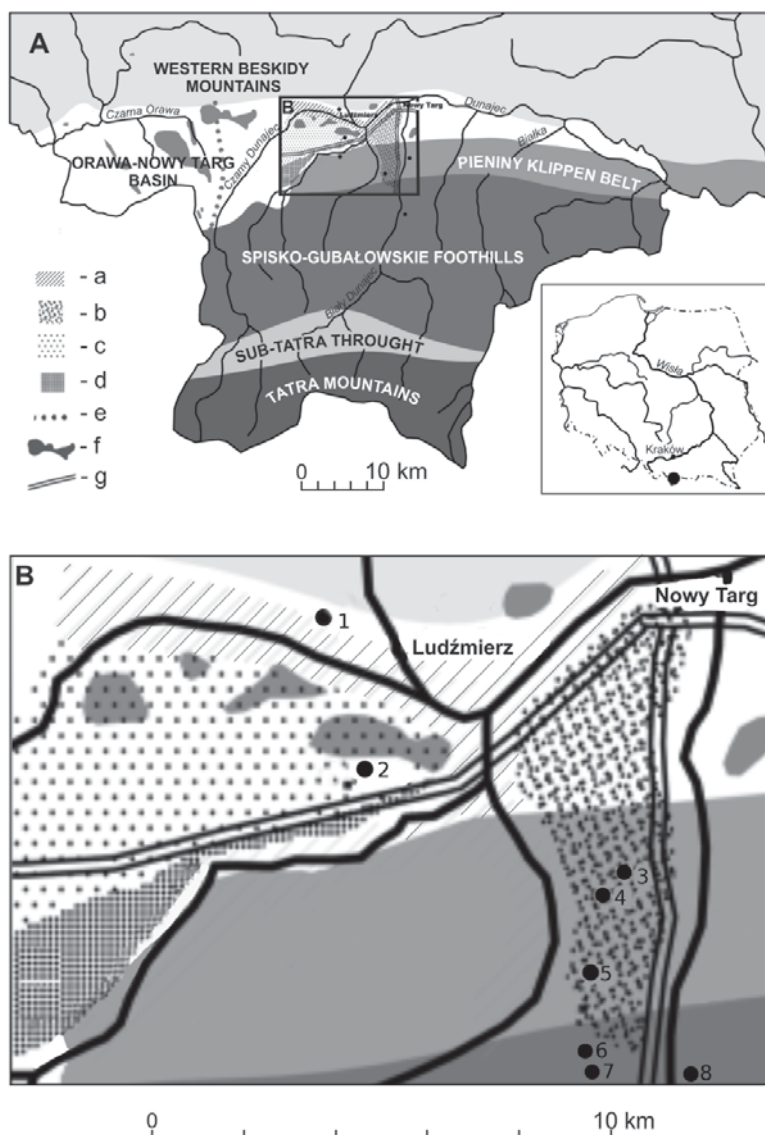


Fig. 1. Location of the main geomorphological units of Western Carpathians mentioned in text and their vicinity (after: Kondracki 1977; Koczur 2006, on the base of: malopolskie — mapa fizyczna: [https://commons.wikimedia.org/wiki/File:Malopolskie\\_mapa\\_fizyczna.png](https://commons.wikimedia.org/wiki/File:Malopolskie_mapa_fizyczna.png), modified).

a — postglacial terraces in the main river valleys; b — Wurm terrace within fluvioglacial funs; c — postglacial terrace within fluvioglacial funs; d — Riss terrace within fluvioglacial funs; e — watershed of the Czarna Orawa and Dunajec Rivers; f — the main peat bogs in the vicinity of researched area; g — main roads; B — Accurate location of researched area and its vicinity (square) in wider geomorphological context: a — postglacial terraces in the main river valleys; b — Wurm terrace within fluvioglacial funs; c — postglacial terrace within fluvioglacial funs; d — Riss terrace within fluvioglacial funs; e — watershed of the Czarna Orawa and Dunajec Rivers; f — the main peat bogs in the vicinity of researched area; g — main roads; Location of sites: 1 — Krauszów, site 2; 2 — Rogoźnik, site 1; 3 — Szaflary, site 1; 4 — Szaflary, site 2; 5 — Bańska, site 1; 6 — Biały Dunajec, site 1; 7 — Biały Dunajec, site 2; 8 — Biały Dunajec, site 3 (powiat Nowy Targ); drawn by the authors.

## GEOLOGY AND GEOGRAPHIC CONTEXT

Polish part of Western Carpathians is divided into two separate parts — Inner Western Carpathians and Outer Western Carpathians. They belong to the blocks of the Earth's crust with diversified structure (German 2005, 124). Geological and morphological boundary between these two units is the Pieniny Klippen Belt (Kondracki 1977, 22; Birkenmajer 1979; 1986; German 2005, 121, 124). Morphological border coincides with the course of Pieniny Klippen Belt, up to the depression of Orawa Basin, where it runs north in Western Beskid Mountains (Klimaszewski 1972; Kondracki 2000).

The Orawa-Podhale Depression consists of several diversified units: Orawsko-Nowotarska Basin, Pieniny Klippen Belt, Spisko-Gubałowskie Foothills and is limited with Sub-Tatra Through (Podtatrzańska Depression; Kondracki 1977, 150). Spisko-Gubałowskie Foothills separates the valleys of Biały and Czarny Dunajec rivers. Also, it is considered as a border between Podhale-Orawa Depression and Poprad Basin (Kondracki 1977, 138, 139). The main part of this unit is made of Paleogene (eocen-oligocen) rocks of Podhale flysh sandstone and shale. The Orawa-Podhale Basin is limited in the south by the ridge of the Tatras, from the north and north-east — Western Beskid Mountains, from the west — by Magura Orawska. Between the Beskid Mountains and the Basin there is a region of Działy Orawskie (Orawa Watershed), constituting an extension of the southern slopes of Babia Góra (Kondracki 1977, 22).

The location of the research area discussed in this work is within three above mentioned entities: Orawa-Nowy Targ Basin, north-western part of the Polish part of Pieniny Klippen Belt and Spisko-Gubałowskie Foothills. It is the part of the Czarny and Biały Dunajec river valleys, within the fluvio-glacial fans of this rivers and its closest vicinity (Łajczak 2009, 696, 697).

The Orawa-Nowy Targ Basin is the lowest part of Podhlańsko-Orawska Depression, extending from Kluszkowce Village in the east to the Lipnica Wielka in the West in Poland, but mostly its area lays in Slovakia (Kondracki 1977, 136; Baumgart-Kotarba 1996). From the geological point of view, it is filled with neogene lymnic and river type molasse, with quaternary fluvio-glacial fans of Tatra glacials located on flysh layers, with river terraces and Holocene peat bogs.

Morphologically, the boundary between Orawa and Nowy Targ Basins is not easily distinguishable. It is supposed to be located in Piekelnik village (Kondracki 2000) or, according to most researches — in the vicinity of Ludźmierz village (comp. i.e. Klimaszewski 1972). Orawa Basin creates a sinkhole limited by the tectonic faults (Pomianowski 1995, 77), imposed on the Magura Nappe, Podhale-flysch and Pieniny Klippen Belt. Meanwhile, Nowy Targ Basin is a narrow strip, formed within the Magura Nappe. The peat bogs zone stretches on both sides of the watershed, from the Białka and Dunajec rivers in the east to the Black Orawa river in the West, mostly — on fluvio-glacial fans, high terraces in watershed areas, erosion cuts or paleochannels of Czarny Dunajec river (Koperowa 1961, 8–10; Obidowicz 1990; Hrynowiecka-Czmielewska 2009; Łajczak

2009). Orawa–Nowy Targ Basin is bordering in the south with Pieniny Klippen Belt. This belt of Mesozoic rocks contains silica, mainly radiolarite layers. In Poland, Pieniny Klippen Belt covers an area of approximately 40–50 km and is divided into several sections — units and sub-units. It reaches to Małe Pieniny in east and to Stare Bystre in the west. Further west, Pieniny Klippen Belt lays under sediments of the Orawa Basin (Birkenmajer 1979).

The Orawa–Podhale Depression is a place with an extremely varied topography — diversified geology of the region results in neighboring of typical highland and para-lowland landscapes.

## ARCHAEOLOGICAL FINDS

### Krauszów, powiat Nowy Targ, sites 1 & 2

Archival site of Krauszów, site 1 was published in 1991 (Dryja, Rydlewski 1991, 216) and is not discussed in this article. The new site of Krauszów, site 2 (Fig. 2:2), is situated on the southern slope of a highland promontory, between the Czarny Dunajec river and its tributary — Lepietnica stream. It is situated close (less than 500 m) to the “archival site”, which, following the detailed site description (Dryja, Rydlewski 1991, 216) was recognized to be inaccessible for survey. It is the westernmost of all sites described in this article.

The artifacts from the site are: a broken end-scrapers and a micro blade-core. The end scraper (Fig. 8:5) was prepared on a wide blade of Jurassic flint. Working edge is in most part destroyed, but preserved part of it is covered with small, steep negatives. The blank shows traces of use of two platforms on the core. While most of the negatives on the dorsal part were knapped from the same direction as the blank itself, one of them was knapped with the use of the second platform.

The micro blade-core from Krauszów 2 (Fig. 8:6) can be described as a core with changed orientation (one of platforms is prepared), with very narrow striking surface, and natural (cortical) sides. The second striking platform appears to have been used for detachment of only one flake. Later the core was discarded. The artifact is made of red radiolarite.

### Rogoźnik, powiat Nowy Targ, site 1

The site of Rogoźnik, discovered during field survey in spring 2016, is located between Wielki Rogoźnik and Czerwony Potok streams in Orawa–Nowy Targ Basin (Fig. 3:2). The artifact that was found there is a double end-scrapers of red radiolarite, prepared on a fragment of a large, broken flake. The side of the artifact is covered with edge retouch, the working edge is prepared with semi-steep retouch. Second working edge is broken, only a small part is preserved. On dorsal side, some surfaces are natural.

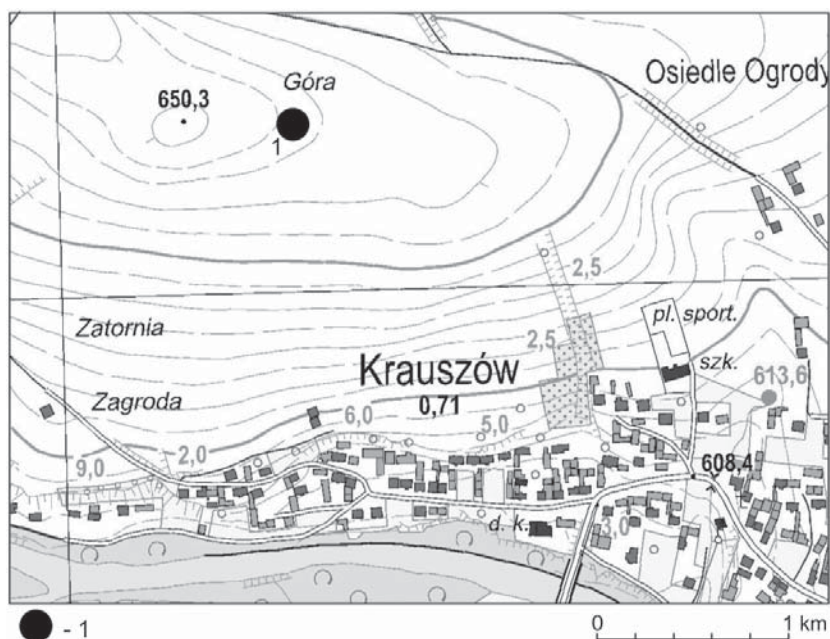


Fig. 2. Location of Krauszów, powiat Nowy Targ, site 2 (on the base of: Mapa topograficzna 1:10 000, licencja RO-IV.7522.196.2016\_12\_CLO); drawn by the authors.

The site can be considered as located in Orawa Basin or at least — in the place of boundary between Orawa and Nowy Targ Basins. This is also the area of the alluvial fan of Czarny Dunajec river and the postglacial terrace of rivers in the vicinity of the relicts of the Riss glaciation terrace (acc. to Łajczak 2009).

A peat bog complex forms an important element of contemporary landscape of the site. The nearest ones are “Młaka” and “Przymiarki” peat bogs. They are located on the terrace at the base of the slope (acc. Łajczak 2009). On the left side of Czarny Dunajec river, approx. 3 km from the site, there is “Grel” peat bog (600 m a.s.l.), known from palynological studies, that documented neolithic occupation in this part of the Basin. It is one of the oldest peat bogs throughout the Orawa-Nowy Targ Depression (Koperowa 1961; 1962; Łajczak 2009).

In the vicinity of the site, radiolarites occur in the Rogoźnik and Trawny streams, and in the secondary beds of sediments of Orawa Basin. The nearest raw materials from primary deposits are located south of the first belt of Maruszyna hills and in the Szeligowa Rock (711 m a.s.l.) of Stare Bystre in the west (Kozłowski *et al.* 1981; Rydlewski 1989, 2009).

Close by, around 5 km to the East, in the Biały Dunajec river valley, “archival sites” are known: from Szaflary and Biały Dunajec villages. They yielded a few finds.

Sites of Szaflary 1 and 2 are located on the left bank of Biały Dunajec river on fluvioglacial fans in the range of Pieniny Klippen Belt (Fig. 4; 5).



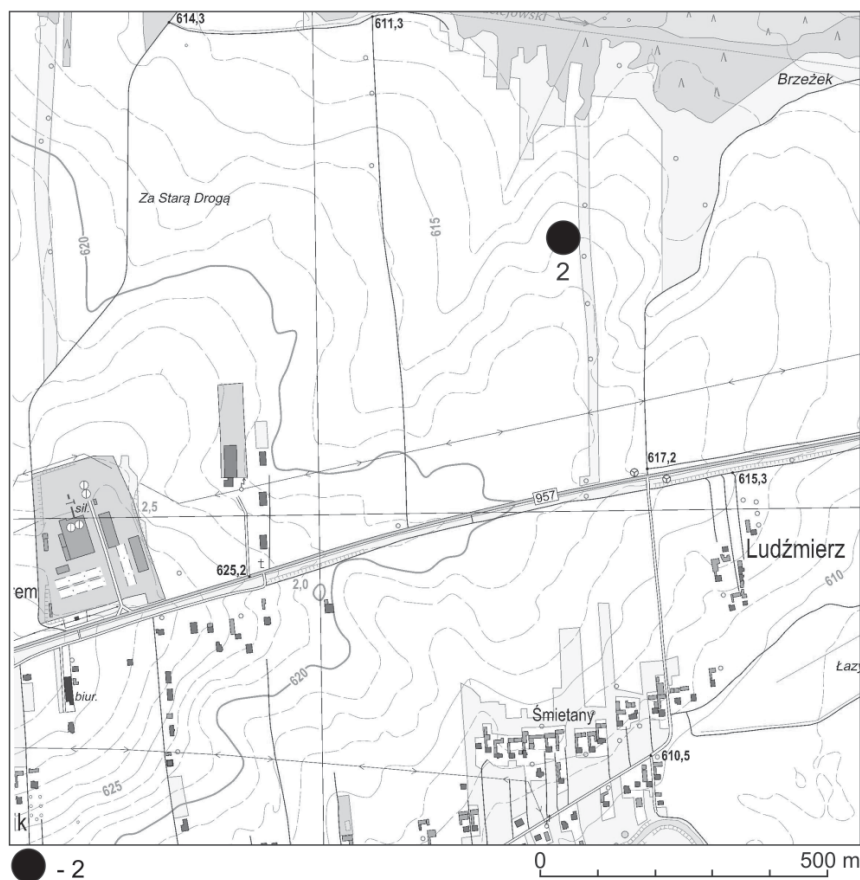


Fig. 3. Location of Rogoźnik, powiat Nowy Targ, site 1 (on the base of: Mapa topograficzna 1:10 000, licencja RO-IV.7522.196.2016\_12\_CLO); drawn by the authors.

### Szaflary, site 1, powiat Nowy Targ

Site is located 150 m to the West of Szaflary limestone quarry, near Szaflary-Maruszyna road (Fig. 4:3). Two artifacts are known from this site. One of them is a proximal part of a wide blade, made of strongly weathered red radiolarite (Fig. 8:9). The striking platform is not preserved. The second artifact is a fragment of Jurassic flint, marginally retouched, with some cortex preserved (Fig. 8:8).

### Szaflary 2, powiat Nowy Targ

Site is located in the North of previous one, on the South-Eastern slope of Raniżberg Mt (Fig. 5:4). The artifact from the surface survey is a small, quadrangular flake of Jurassic Cracow flint, visibly patinated (Fig. 8:7). Dorsal face of

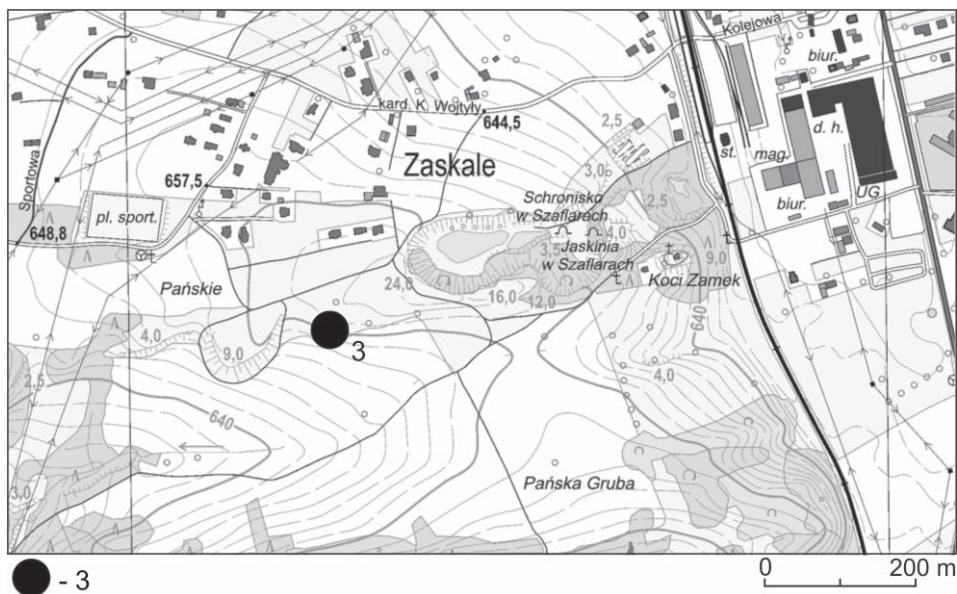


Fig. 4. Location of Szaflary, powiat Nowy Targ, site 1 (on the base of: Mapa topograficzna 1:10 000, licencja RO-IV.7522.196.2016\_12\_CLO); drawn by the authors.

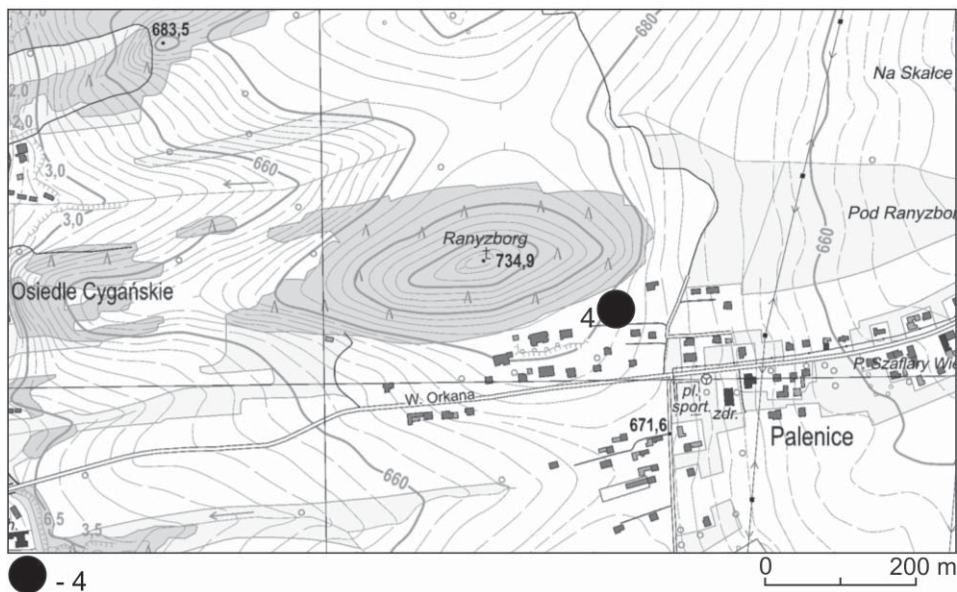


Fig. 5. Location of Szaflary, powiat Nowy Targ, site 2 (on the base of: Mapa topograficzna 1:10 000, licencja RO-IV.7522.196.2016\_12\_CLO); drawn by the authors.

the artifact is formed with several flat negatives. No precise chronology can be assigned to this artifact.

In the vicinity of both sites in Szaflary, there are rich beds of radiolarites, located in limestone rocks of Pieniny Klippen Belt.

#### Bańska, site 1, powiat Nowy Targ

The site is located also on the left bank of Biały Dunajec river on the slope (Fig. 6:5). One artifact was discovered on this site. It is a small flake, made of Jurassic Cracow flint. On its dorsal side, two negatives knapped from opposite directions are visible.

#### Biały Dunajec, site 1, powiat Nowy Targ

Three more sites are known from Biały Dunajec. A few finds are known from this area, which is located in flysh zone of the Spisko-Gubałowskie Foothills (Fig. 6:6). Site is located in the Bańcowski stream valley on the steep hill slope.

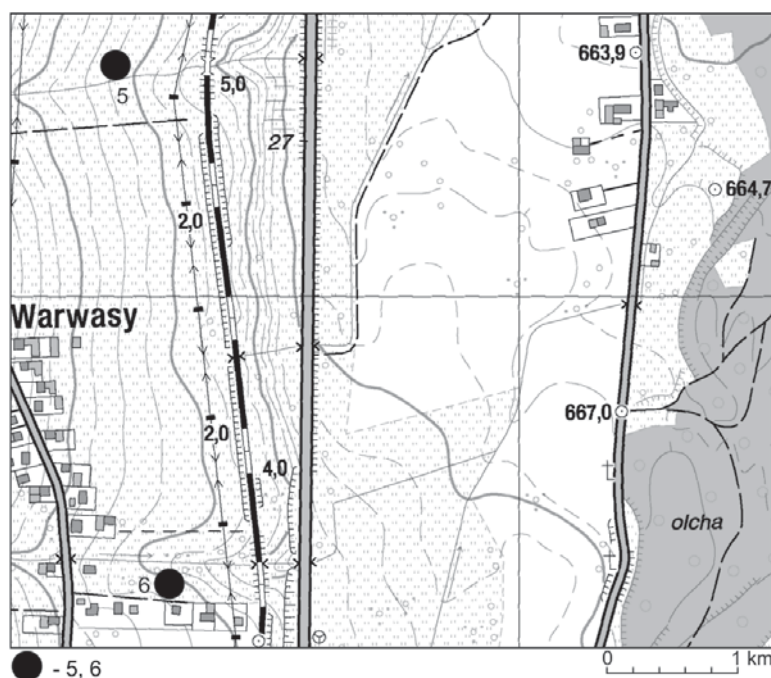


Fig. 6. Location of sites: 5 — Bańska, powiat Nowy Targ, site 1; 6 — Biały Dunajec, powiat Nowy Targ, site 1 (on the base of: Mapa topograficzna 1:10 000, licencja RO-IV.7522.196.2016\_12\_CLO); drawn by the authors.



Two flint artifacts were discovered here: a part of a flake, with retouched edge (Fig. 1:1), and a blade with notched retouch on both, parallel sides (Fig. 8:2). Retouch preparation resembles splinter technique. Both artifacts were obtained from single-platform core with very acute angle between the striking platform and the striking surface.

#### Biały Dunajec, site 2, powiat Nowy Targ

Second site was discovered on the eastern slope of a hill in Strachonie hamlet (Fig. 7:7). It has yielded a small artifact of red radiolarite — negative nodule of small dimensions (Fig. 8:3).

#### Biały Dunajec, site 3, powiat Nowy Targ

The last site in this village is situated on the right bank of Biały Dunajec river, in the vicinity of Gutów stream, on the western slope of the hill (Fig. 7:8). One artifact was found there: flint fragment of the core, with one face bearing marks of detached flakes and other surfaces being natural, inner fractures (Fig. 8:4).

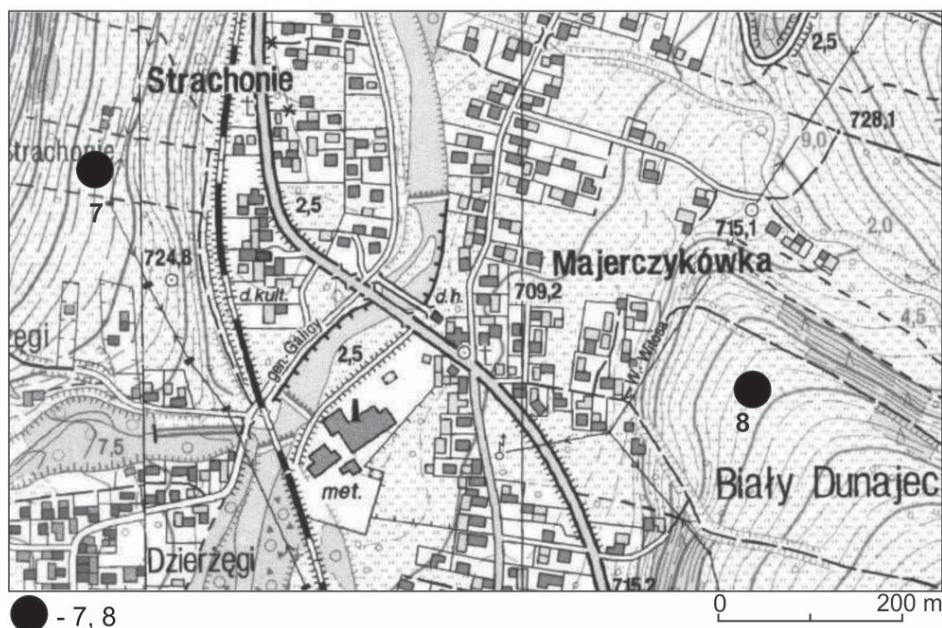


Fig. 7. Location of sites: 7 — Biały Dunajec, powiat Nowy Targ, site 2; 8 — Biały Dunajec, powiat Nowy Targ, site 3 (on the base of: Mapa topograficzna 1:10 000, licencja RO-IV.7522.196.2016\_12\_CLO); drawn by authors.

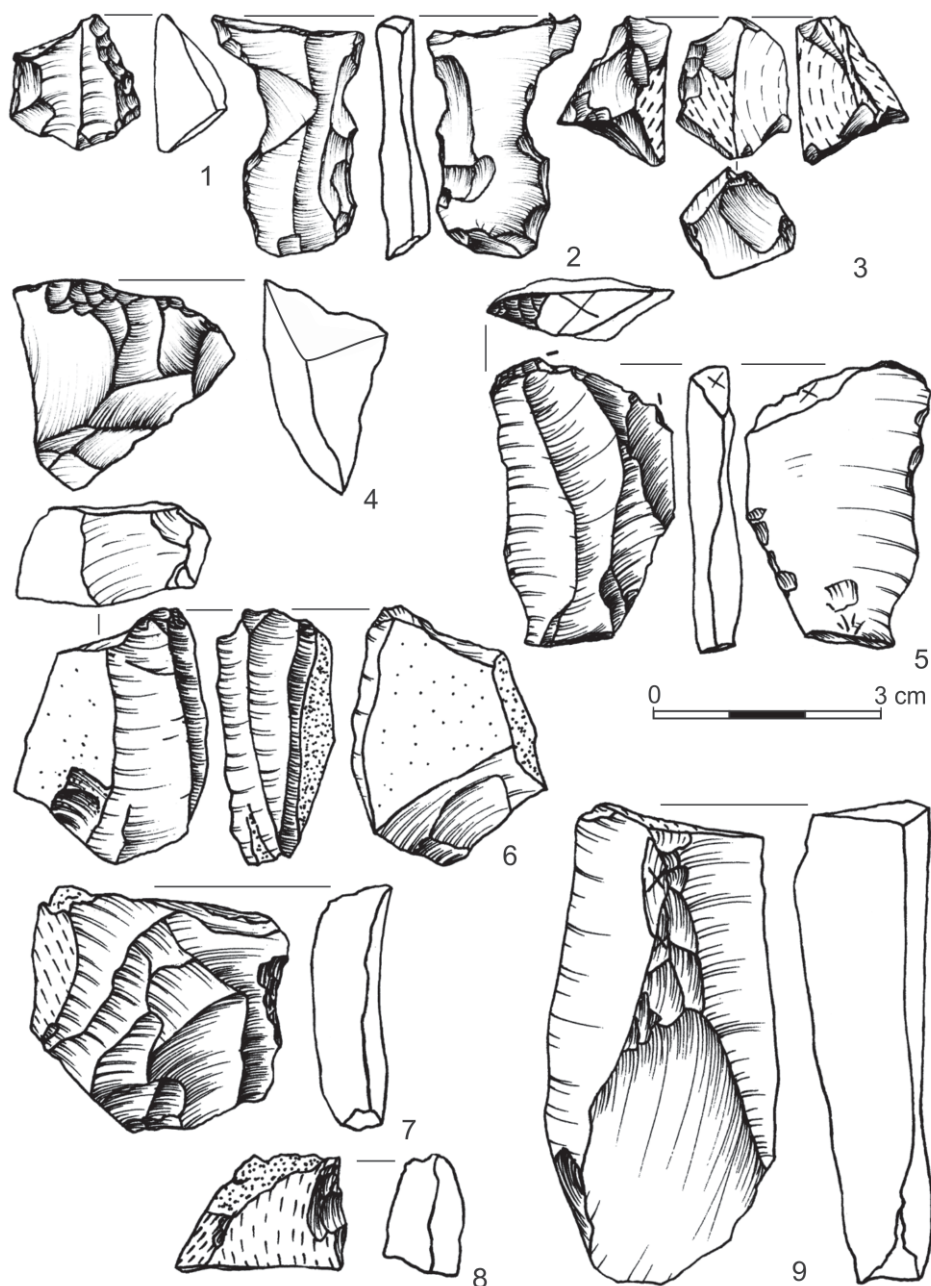


Fig. 8. Artifacts from sites: 1, 2 — Biały Dunajec, site 1; 3 — Biały Dunajec, site 2; 4 — Biały Dunajec, site 3; 5–6 — Krauszów, site 2; 7 — Szaflary, site 2; 8–9 — Szaflary, site 1.

1 — part of retouched flake, Jurassic Cracow flint; 2 — part of blade with notched retouch, Jurassic Cracow flint; 3 — negative nodule, red radiolarite; 4 — fragment of core, Jurassic Cracow flint, 5 — end scraper, Jurassic Cracow flint, 6 — micro bade-core, red radiolarite, 7 — flake, Jurassic Cracow flint, 8 — negative nodule, Jurassic flint, 9 — proximal part of blade, red radiolarite; drawn by M. Cieśla.

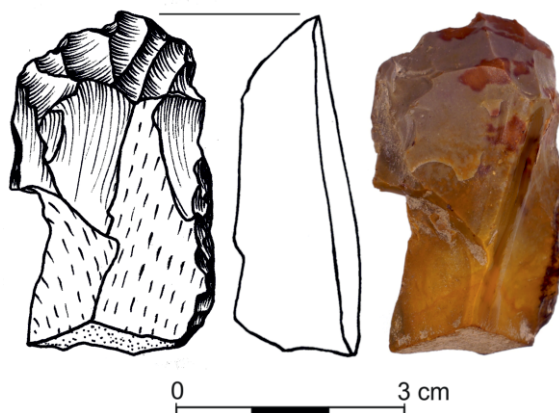


Fig. 9. End-scraper from Rogoźnik, powiat Nowy Targ, site 1, red radiolarite; drawn by M. Cieśla.

## DISCUSSION

In the state of research of Stone Age and Early Bronze Age in the basin of Vistula river, between geographical units, several differences can be observed. Described territory is a subject of study for comparatively short period of time. In initial phase of development of archaeology, Carpathian sites, located even in Tatra Mts. (e.g. Magury Cave; Jura 1955) were studied in the same manner as those from regions nowadays considered as classic for Polish archaeology (like Cracow–Częstochowa Upland). Later came a phase of regression of research. The area of Dunajec river upper catchment basin lacks well described, important finds. Existing literature (e.g. Rydlewski 1989; Dryja, Rydlewski 1991; Valde-Nowak 1991) concentrates mainly (although not exclusively) on the banks of Dunajec, downstream from the fork of Biały Dunajec and Czarny Dunajec rivers.

Contemporarily, the necessity of the further research is contradicted by the fact, that agriculture is almost non-existent in the region of Podhale. The lack of cultivated fields impedes research — the area is mostly inaccessible for surface survey.

Characteristics of archaeological sites from the described region are important for the understanding of prehistoric settlement mechanics in mountainous areas. Choice of raw materials include radiolarite (red color variation) and Jurassic Cracow flint. Radiolarite, as mentioned above, is a local rock, accessible for prehistoric people. As erratic material, flint can be found as far as the southernmost border of maximum glaciation, reaching northern slopes of Carpathians, approximately 80 km from the area of interest (Dudziak 1961; Klimaszewski 1972). Any piece of this raw material must have been brought here by people. Consequently, this raw material should be treated as archaeologically important even in situations, when no traces of knapping can be observed on a concretion.

A range of sites presented above can easily be linked with the Stone Age period and perhaps with Early Bronze Age period. The chronological attribution of the finds can be stated only on the basis of their typological and technological character, yet, in some cases, we consider them to be quite clear in this respect. The sites, where overall chronology can be proposed, are Krauszów, Biały Dunajec, site 1, Szaflary, sites 1, 2 and Rogoźnik.

Szaflary, site 2 yielded an artifact that can be considered as the oldest in the discussed inventory. Paleolithic chronology can be proposed. The flake is strongly patinated.

Slightly more precise chronology, probably Upper or Late Palaeolithic, can be suggested for massive blade from Szaflary, site 1. In this case, technological traits show evident traces of crest-blade processing. It should be underlined, that this artifact is made of red radiolarite, raw material with outcrop in the close vicinity of the site.

Similar, Upper or Late Paleolithic chronology can be suggested for a broken, double end-scraper from Rogoźnik. One may assume, that such features as the form of working edge, triangular cross section and thick proportions of the blank (broken, massive flake — not tarnovian) suggest, that Swiderian identification of the artifact cannot be excluded (e.g. Schild 1975). In this context, it is worth mentioning, that Swiderian campsite is known from Dział — site situated in 5 km distance (Rydlowski 1990).

Small, red radiolarite core from Krauszów can be linked with Mesolithic period. Such a supposition can be based on the techno-typological traits of the artifact: narrow striking surface and small dimensions of the item. In Biały Dunajec, site 1, stylistic of the tool demonstrates some common features with the terminal flint industries.

## CONCLUSION

Modest as they may seem, the finds from abovementioned sites have a great importance for the understanding of settlement mechanics in Podhale and Orawa region in prehistory. One may suppose, that finds point towards undertaking of the raw material workshop activity (crest-blade from Szaflary, site 1), but also that the region might have been treated as a convenient settlement area — a find of an end-scraper may suggest, that the area was treated not only as a base for raw material extraction, but also as a possible (perhaps long term) settlement place.

Paleolithic and post-Neolithic settlement in the region is better recognized, and now backed with new, significant data. Of certain importance is the fact, that those two chronological horizons were known in the territory for some time already, and every new research yields even more finds connected with them.

Although traces of older and younger settlement are more numerous, there is now also quite a clear trace of Mesolithic occupation, found in Krauszów. In those circumstances, the constant lack of Neolithic finds is noteworthy. More information about the raised questions can be gathered only by consecutive research.



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